CLAIMS

What is claimed is:

1. A method for controlling a switching circuit comprising:

measuring signals from a sensor in response to an actuating object;

randomly sampling the measured signals; and

changing a state of an output signal based upon the randomly sampled measured signals.

2. The method of claim 1, wherein measuring includes converting the sampled signals to digital values, and wherein the digital values are accumulated and compared to a threshold value for determination of the state of the output signal.

3. The method of claim 1, wherein the signals are measured in response to a measurement strobe signal, the random sampling being based upon randomization of intervals between strobe signals.

4. The method of claim 3, comprising measuring noise-responsive signals from the sensor in the absence of the measurement strobe signal, and determining a relative noise level based upon the noise-responsive signals.

5. The method of claim 4, wherein state of the output signal is not changed when the relative noise level is above a predetermined threshold.

6. The method of claim 1, wherein signals are measured and randomly sampled from two sensors, and the state of the output signal is changed based upon the randomly sampled measured signals from both sensors.

7. The method of claim 6, wherein the randomly sampled measured signals from the two sensors are compared to predetermined ranges and, based upon the comparison, a determination is made whether the output signal is to be placed in an off state or an on state, or whether a fault condition exists.

8. The method of claim 1, wherein the measured signals are generated by capacitive coupling of the actuating object with a sensing circuit.

9. A method for controlling a switching circuit comprising:

generating signals from a sensor in response to an actuating object and a strobe signal applied to the sensor at random intervals;

sampling the generated signals; and

changing a state of an output signal based upon the sampled signals.

10. The method of claim 9, comprising converting the sampled signals to digital values, and wherein the digital values are accumulated and compared to a threshold value for determination of the state of the output signal.

11. The method of claim 9, comprising measuring noise-responsive signals from the sensor in the absence of the strobe signal, and determining a relative noise level based upon the noise-responsive signals.

12. The method of claim 11, wherein state of the output signal is not changed when the relative noise level is above a predetermined threshold.

13. The method of claim 9, wherein signals are generated and sampled from two sensors, and the state of the output signal is changed based upon the signals from both sensors.

14. The method of claim 13, wherein the signals from the two sensors are compared to predetermined ranges and, based upon the comparison, a determination is made whether the output signal is to be placed in an off state or an on state, or whether a fault condition exists.

15. The method of claim 9, wherein the measured signals are generated by capacitive coupling of the actuating object with a sensing circuit.

16. A method for controlling a switching circuit comprising:

generating signals from a sensor in response to an actuating object and a strobe signal applied to the sensor at random intervals;

sampling the generated signals;

sampling noise-responsive signals from the sensor in the absence of the strobe signal; and

changing a state of an output signal based upon the generated signals and the noise-responsive signals.

17. The method of claim 16, comprising determining a relative noise level based upon the noise-responsive signals, and wherein state of the output signal is not changed when the relative noise level is above a predetermined threshold.

18. The method of claim 16, comprising converting the sampled signals to digital values, and wherein the digital values are accumulated and compared to a threshold value for determination of the state of the output signal.

19. The method of claim 16, wherein signals are generated and sampled from two sensors, and the state of the output signal is changed based upon the signals from both sensors.

20. The method of claim 19, wherein the signals from the two sensors are compared to predetermined ranges and, based upon the comparison, a determination is made whether the output signal is to be placed in an off state or an on state, or whether a fault condition exists.

21. The method of claim 16, wherein the measured signals are generated by capacitive coupling of the actuating object with a sensing circuit.

22. A method for controlling a switching circuit comprising:

generating signals from a plurality of sensors in response to an actuating object and a strobe signal applied to the sensors at random intervals;

sampling the generated signals; and

changing a state of an output signal based upon the sampled signals from the plurality of sensors.

23. The method of claim 22, wherein the signals from the plurality of sensors are compared to predetermined ranges and, based upon the comparison, a determination is made whether the output signal is to be placed in an off state or an on state, or whether a fault condition exists.

24. The method of claim 22, comprising measuring noise-responsive signals from the sensor in the absence of the strobe signal, and determining a relative noise level based upon the noise-responsive signals.

25. The method of claim 24, wherein state of the output signal is not changed when the relative noise level is above a predetermined threshold.

26. A system for controlling a switching circuit comprising:

a sensing circuit configured to generate signals in response to an actuating object and strobe signals applied to the sensing circuit at random intervals;

a sampling circuit for sampling the signals generated by the sensing circuit; and

a switching circuit configured to change a state of an output signal based upon the sampled signals.

27. The system of claim 26, comprising a second sensing circuit configured to generate second signals in response to the actuating object and the strobe signals, the switching circuit being configured to change the state of the output signal based upon sampled signals from both sensing circuits.

28. A system for controlling a switching circuit comprising:

a first capacitive sensing circuit configured to generate first signals in response to an actuating object and first strobe signals applied to the first sensing circuit at random intervals;

a second capacitive sensing circuit configured to generate second signals in response to an actuating object and second strobe signals applied to the second sensing circuit at random intervals;

a sampling circuit for sampling the first and second signals; and

a switching circuit configured to change a state of an output signal based upon the sampled first and second signals.

29. The system of claim 28, wherein the sampling circuit is configured to sample noise-responsive signals from the first and second sensing circuits in the absence of the strobe signals, the switching circuit being configured to change the state of the output signal based upon the sampled noise responsive signals.

30. The system of claim 28, wherein the switching circuit is configured not to change the state of the output signal if the noise responsive signals indicate an elevated noise level.

31. A system for controlling a switching circuit comprising:

a capacitive sensing circuit configured to generate signals in response to an actuating object and strobe signals applied to the sensing circuit at random intervals;

a sampling circuit for sampling the signals generated by the sensing circuit, and to sample noise-responsive signals generated by the sensing circuit in the absence of the strobe signals; and

a switching circuit configured to change a state of an output signal based upon the sampled signals.

32. The system of claim 31, wherein the switching circuit is configured to determine a relative noise level based upon the noise-responsive signals, and wherein state of the output signal is not changed when the relative noise level is above a predetermined threshold.

33. A system for controlling a switching circuit comprising:

means for generating signals from a sensor in response to an actuating object and a strobe signal applied to the sensor at random intervals;

means for sampling the generated signals; and

means for changing a state of an output signal based upon the sampled signals.

34. A system for controlling a switching circuit comprising:

means for generating signals from a sensor in response to an actuating object and a strobe signal applied to the sensor at random intervals;

means for sampling the generated signals;

means for sampling noise-responsive signals from the sensor in the absence of the strobe signal; and

means for changing a state of an output signal based upon the generated signals and the noise-responsive signals.

35. A system for controlling a switching circuit comprising:

means for generating signals from a plurality of sensors in response to an actuating object and a strobe signal applied to the sensors at random intervals;

means for sampling the generated signals; and

means for changing a state of an output signal based upon the sampled signals from the plurality of sensors.